Tire Shreds:
Solutions for
CIVIL
ENGINEERS

Tire Shreds in Civil Engineering Applications

Civil engineers should consider specifying scrap tires for three simple reasons:

- Tire shreds have properties that are useful in civil engineering applications.
- Use of tire sheds can save money over other materials with similar properties.
- Even small projects can put large numbers of waste tires to productive use.

Advantages of Tire Shreds

Tire shreds are half the weight of gravel so they can replace light-weight materials such as polystyrene blocks, expanded shale, wood chips, and foamed concrete when building embankments on weak soil and rock. In addition to light weight, their compressibility and high permeability make tire shreds an excellent backfill material for retaining walls. Lateral pressure produced on walls by tire shreds can be as low as half that of conventional gravel backfill, significantly reducing the cost of the wall.

Tire shreds have a drainage capacity 10 to 100 times higher than gravel, making them a superior choice for drainage layers in roads and landfills. They also provide good thermal insulation (8 times better than gravel) and negligible environmental impact. And contractors can easily place the 2-inch to 12-inch pieces using conventional earthmoving equipment.

Successful Projects

Engineers can take advantage of these properties to overcome challenging design problems. Successful uses for tire shreds in civil engineering projects include:

- Supplemental drainage and liner protection layer for the Newland Park Landfill in Wicomico County, Maryland (1.4 million tires).
- Lightweight fill for a 32-ft high highway embankment constructed on weak clay in Portland, Maine (1.2 million tires).
- Drainage layer for landfill cap over a Superfund site in Rockingham, Vermont (800,000 tires).
- Lightweight fill to stabilize a landslide on U.S. Route 42 near Roseburg, Oregon (580,000 tires).
- Lightweight backfill for a rigid frame bridge in Topsham, Maine (100,000 tires).

Cost savings over using conventional construction material can be impressive. For example, use of tire shreds for lightweight fill in the Portland, Maine highway embankment saved the Maine Turnpike Authority $300,000.

California Poised to Take Advantage of Tire Shreds

The Scrap Tire Management Council estimates that 18 to 20 million tires were used in civil engineering applications in 1998, making this the second largest end use for scrap tires.

California has all the factors needed for a major expansion of civil engineering applications for tire shreds:

- Challenging soil conditions throughout the state, ranging from weak San Francisco Bay mud to landslide-prone hillsides in the Sierra and the along the coast.
- Major landfill construction in several parts of the state.
- A ready supply of scrap tires.

With typical projects using more than 1 million tires each, it is clear that civil engineering applications can play a major role in managing California's flow of scrap tires.
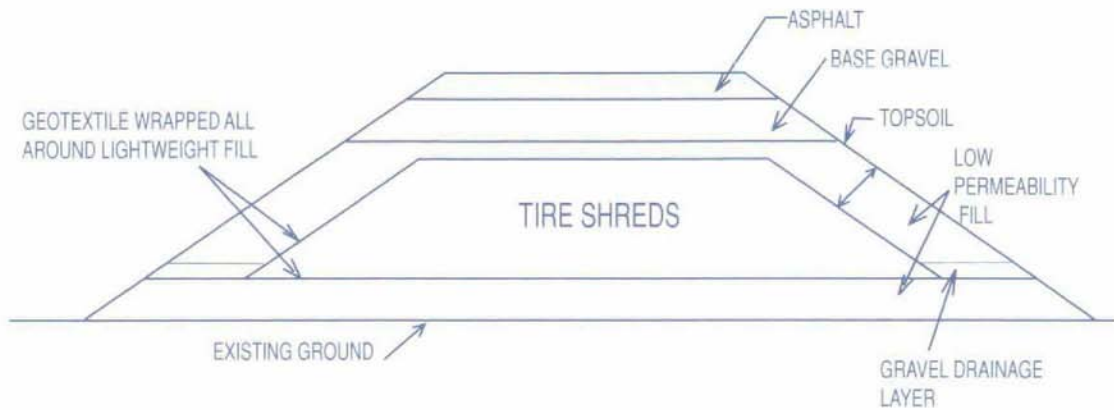
CROSS SECTION OF ROAD USING TIRE SHREDS AS LIGHT WEIGHT FILL

Guidelines Available

ASTM D6270-98, "Standard Practice for Use of Scrap Tires in Civil Engineering Applications", is a commonly used guideline available to help engineers design their projects.

The California Integrated Waste Management Board also has the following guides available:

- *Tire Shreds as Leachate Drainage Material at Municipal Solid Waste Landfills.*

- *Tire Shreds as Final Cover Foundation Layer at Municipal Solid Waste Landfills.*

- *Tire Shreds as Operations (Protective) Layer Material at Municipal Solid Waste Landfills.*

- *Tire Shreds as Landfill Gas Collection Layer Material at Municipal Solid Waste Landfills.*

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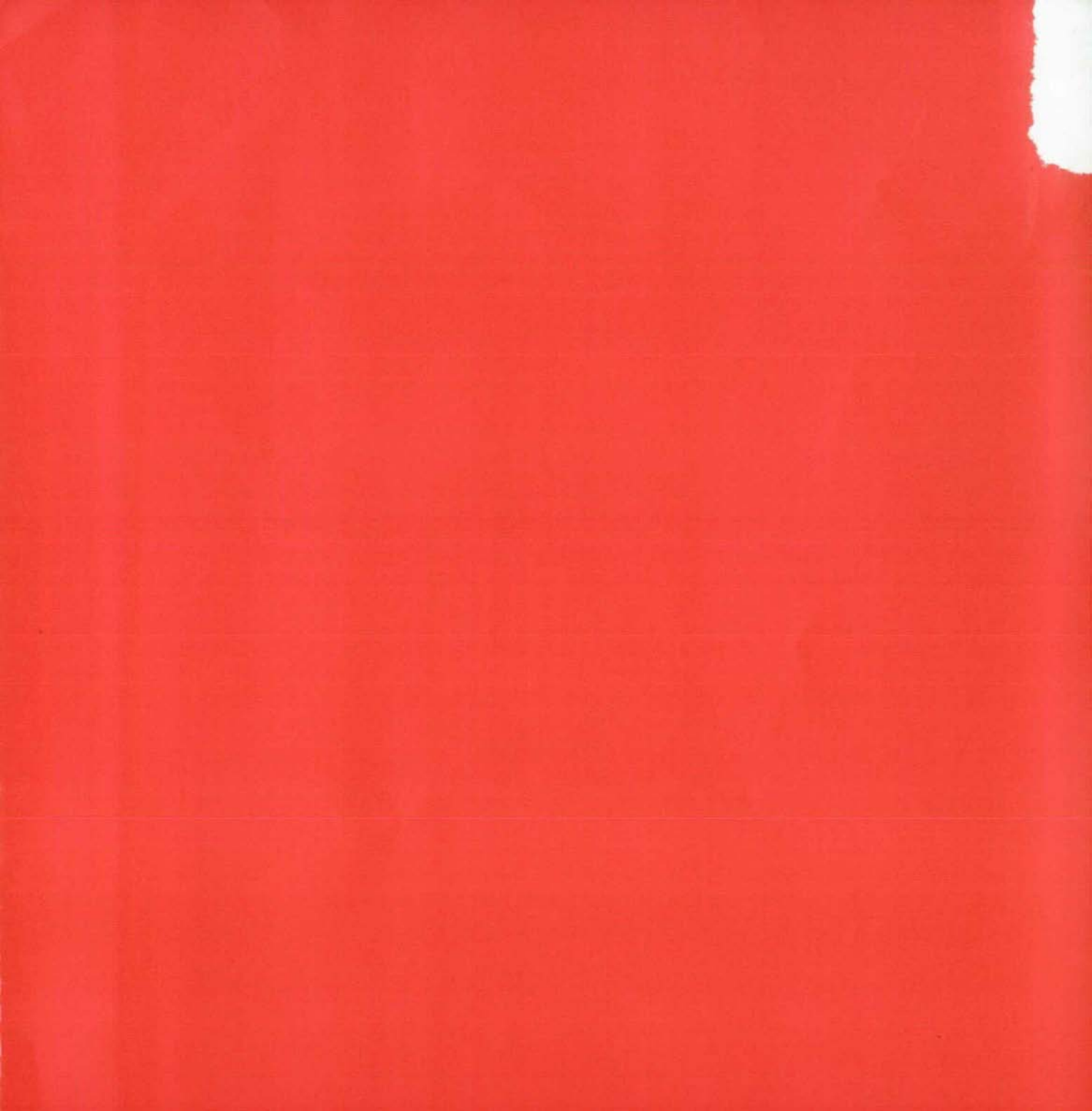
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